3-HEAD

CASSETTE TAPE DECK

CT-F900

D
D/G
HG

OPERATING INSTRUCTIONS

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IMPORTANT NOTICE

CT-F900 are designed to operate 220V or 240V (HG model) main and 120V, 220V or 240V (D, D/G model) main. Before turning on the power, please confirm the line voltage setting indicated on the rear of your unit corresponds to the supply voltage in your area; if not, change the setting as described in Line Voltage and Rear Panels on page 16.

PIONEER®

FEATURES

Transport Section Engineered for Stable Tape Run

This deck features the closed loop dual capstan system whereby a capstan is stationed on either side of the heads. This system maintains a stable contact between the heads and the tape so that the tape travels at a constant tension all the time, and it also helps to suppress dropouts in the tape and fluctuations in the level. Another important point is that external vibration transmitted from the reel bases and tape guides to the tape is kept down to the minimum for a marked reduction in the modulation noise and both recording and playback which are faithful to the original sound.

The DC servo motor which provides a stable rotational speed is combined with the ultra-precision-engineered capstans and good dynamic balance flywheels to yield a truly superior tape transport performance, and a great improvement in the wow and flutter characteristics.

Yet another prime feature is the mechanical governor motor with its powerful rotation torque and less ripple. This is used for the take-up operations, and enables reliable fast forward and rewind operations.

Three-Head System with Recording/Playback Combination Head

This deck adopts a recording head and a playback head which are combined to fit neatly into a single case as a tidy package. Each head is made of a sendust core and this makes it possible to exploit the features of both chrome tapes and ferrichrome tapes to the full. The heads are provided with a high level of resistance to wear and are tailored to produce top-notch distortion characteristics with high input signal levels as well as an excellent frequency response and signal-to-noise ratio. The contact between the heads and the tape is surefire and firm and the adhering of dust and generation of noise caused by magnetization are reduced to the minimum. These are just a few of the amazing powers of the heads. What's more, the combination head can be used to monitor a recording virtually in real time if the playback head is put to work while you are recording.

Built-In Microprocessor Gives Digital Level Indication and Tape Counter

This deck contains a 'brain': a 4-bit parallel processing 1-chip microprocessor which is the secret behind the digital indication of the recording and playback levels on the fluorescent display tubes. The level meter extends to cover a range from -20dB up to +7dB. Indication between -4dB and +7dB is in 1dB steps which allows high-level signals movements to be grasped at a glance and the recording level to be set just as easily.

The level meter can serve to display normal VU readout, or it can be made to function as a peak meter to detect accurately pulse-like sound. Moreover, while the meter is working as a peak meter, the maximum level of the program source can be held on the display simply by depressing the peak hold switch. All these functions are made possible by three meter switches. If they are selected in accordance with the program source which is being recorded, you will be assured of faithful recordings which feature a good signal-to-noise ratio even with program sources with wide dynamic ranges.

The tape counter is another dramatic new feature. Instead of the usual mechanically rotating figures, it comes in the form of a 3-digit 'digitron' display tube which makes use of the built-in microprocessor and its counter function to detect the pulses generated as the reel bases rotate. These pulses are translated into digits which are then displayed. This electronic tape counter is extremely handy.

Equalizer Circuit and Bias Control Mechanism Aimed at Making the Most of the Tapes' Characteristics

The built-in equalizer circuitry is specially designed to cater not only to chrome tapes but also to ferrichrome tapes and standard tapes. There's a bias control knob, too, which allows you to adjust the bias current in accordance with the type of tape you are using in the deck. The equalizer circuitry with its dedication to accuracy and the bias control ensuring the ideal value team up to give tape recordings with an extremely low level of distortion at all times. You can also obtain the frequency response of your choice by changing the value of the bias current.

If you load a chrome tape with the extra detection holes into your deck, the equalizer circuitry and the bias current will both be selected automatically by the automatic selector mechanism. This means that you do not have to fiddle around making adjustments after loading.

Feather-Touch Electronic Mechanical Control Based on LSI (Large-Scale Integrated Circuitry)

The tape transport selector mechanism employs electronic mechanical control based on a dual-in-line 24-pin C MOS LSI circuit. You can set the deck to any mode, whether playback, recording, fast forward, rewind or stop, from one mode directly with a feather touch operation. When the tape transport is changed over from fast forward to play or from fast forward to rewind by the commands from the LSI's program, the deck is put through the stop mode automatically. This means that the tape is never harmed in any way. Even when two mode buttons are depressed accidentally together, the deck is set to the stop mode first and so there is absolutely no fear of a breakdown of malfunction.

Microprocessor with Six Different Programs in Its Memory

The LSI accommodates six different programs: the MEMORY STOP which automatically rewinds the tape to the position where the tape counter was set to '000'; the MEMORY PLAY which commences playback again after the tape has been stopped; the REPEAT END which repeats tape playback automatically from the tape start point; the COUNTER REPEAT which repeats the tape playback from the start of the program where the tape counter was set during playback to '000' up to the end of the tape rewind; as well as the unattended recording and wake-up playback functions which can be employed when you hook up an optional timer to the deck.

Variety of Accessory Mechanisms

Input selector switch:

This switch can be selected between the program source connected to the rear panel input jacks and the sound from a microphone.

Dolby* noise reduction system:

A newly developed low-distortion IC is used for the Dolby system. This serves to reduce greatly the irritating noise heard when you play back a tape, and it does this without impairing the sound quality of the original program source. This helps to increase the dynamic range, and it allows recordings and play back with a good signal-to-noise ratio.

Front Panel Design Based on Concepts of Human Engineering for Superior Functionality

The front panel adopts a design which provides for easy operation of the feather-touch control switches and also a digital display. The end result is an extremely simple yet superbly functional design employing the very latest in electronics technology.

Manufactured under license from Dolby Laboratories.
*Dolby and DD are trademarks of Dolby Laboratories.

CONNECTIONS

Connect the CT-F900's terminals (OUTPUT—INPUT) to the tape terminals on the receiver (or stereo amplifier) with the accessory cords. The top terminal is for the left channel and the bottom for the right channel (Fig. 1).

Connections for playback: connect the TAPE PLAY input terminals on the receiver to the CT-F900's OUTPUT (PLAY) terminals.

Connections for recording: connect the receiver's TAPE REC output terminals to the CT-F900's INPUT (REC) terminals.

Using the DIN (REC/PLAY) connector: If the receiver is equipped with DIN recording/playback connector, use DIN recording/playback cord, which is sold separately, to connect the DIN (REC/PLAY) connector on the CT-F900 and the receiver (Fig. 2). There is no need for the accessory connecting cords since the same connections serve for both recording and playback.

NOTE:
If you do not connect properly, you will hear a monotonous single-pitched hum and this will impair your recording.

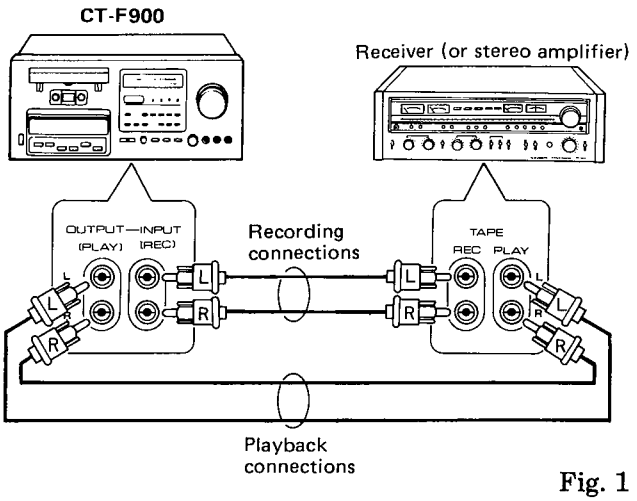


Fig. 1

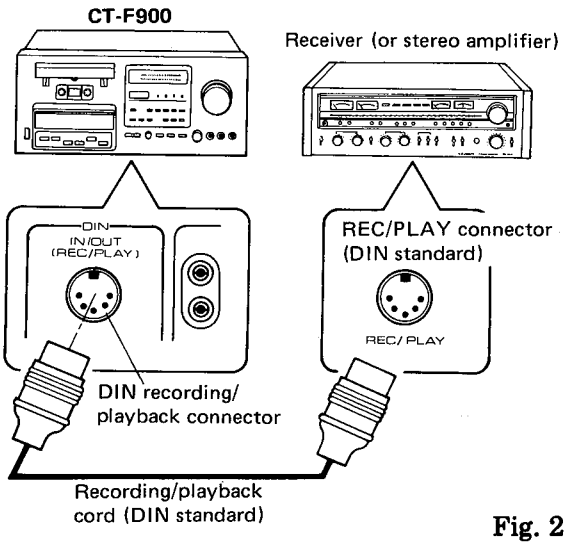


Fig. 2

HANDLING THE POWER CORD

- Always take hold of the plug to unplug it from the power outlet; do not unplug it by pulling on the cord. The cord may be damaged if you keep pulling on it.
- Do not handle the power cord with wet hands. This is extremely dangerous because you may get an electric shock.

INSTALLATION

To ensure the best sound quality and trouble-free operation, avoid setting up the tape deck in any of the locations described below.

Location liable to downgrade performance and result in breakdowns	Resulting trouble
1. Locations exposed to direct sunlight, or near heaters or other heat sources.	1. External heat causes the performance of the electronic parts to deteriorate, and operation becomes unstable.
2. Locations with poor ventilation, or with high humidity or moisture contents, or dusty locations.	2. Cause of faulty contact in input/output terminals, and rust. High humidity and a high moisture content cause deterioration in insulation. There is also the danger of current leakage and heat generation in the circuit parts. Dust or grease in the rotating parts causes the parts to deteriorate.
3. Locations susceptible to vibration.	3. These locations affect the precision parts adversely.
4. Locations where there are thinners, benzine and other types of volatile liquids, insect sprays or any kind of inflammable objects at hand.	4. These help to corrode the front panel. In particular, the heads are precision-finished to micron dimensions. Chemicals may reduce their performance, so exercise all due care.

NOTE:
In rare case, the level meter and tape counter may not be normally operated, when switching the POWER "ON-OFF" continuously.
In this case, switch the POWER "OFF" and set the POWER "ON" again a few seconds later.
Then it will be normally operated.

FRONT PANEL FACILITIES

POWER SWITCH

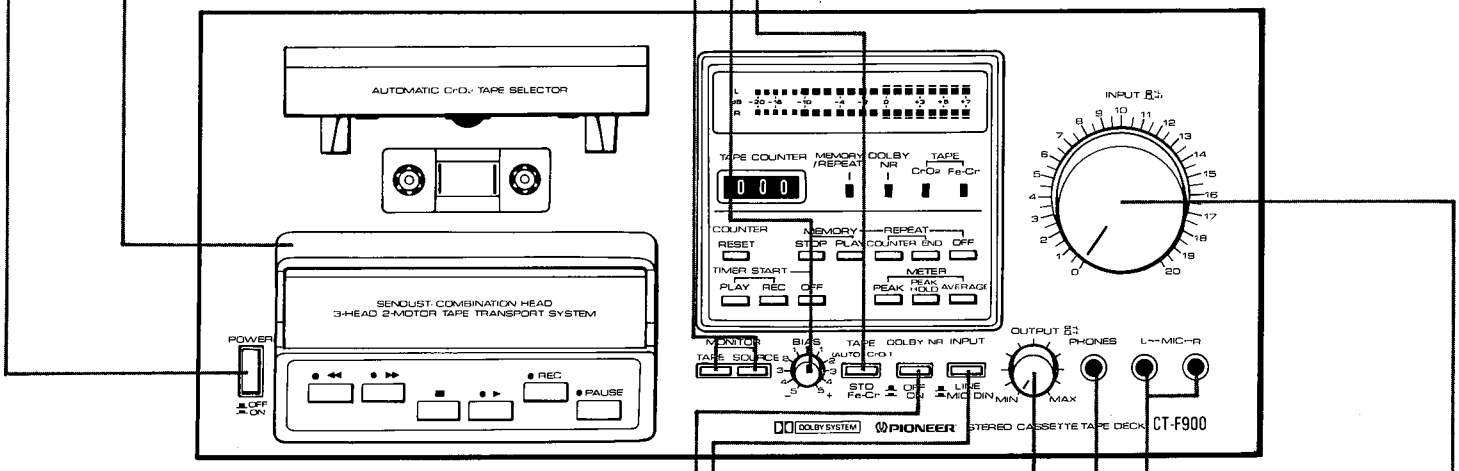
The power comes on when the POWER switch is depressed. The level meter and tape counter, and the tape remaining display lamp will then come on.

MONITOR SWITCHES

You will be able to listen to the recorded signals (playback sound) if you depress the TAPE switch while you are recording a program. You will be able to listen to the signals (recording input) just before they are recorded if you depress the SOURCE switch. Use these switches to monitor your recording. Depress the TAPE switch during playback.

DUST COVER

When you are not using the deck, always keep this cover in place to prevent dust and dirt from adhering to the head section and rotating parts.



DOLBY NR SWITCH

Set this switch to ON for recording with the built-in Dolby noise reduction system and for the playback of tapes which have been Dolby-recorded.

INPUT SELECTOR SWITCH

Use this switch to select the program source which you intend to record.

LINE: Set to this position for recording a program source which is connected to the rear panel INPUT jacks.

MIC/DIN: Set to this position for recording signals from a microphone which is connected to the MIC jack or rear panel DIN connector.

NOTE:
You will be able to record signals from the INPUT jacks if the LINE switch is depressed even when the microphones are plugged into the MIC jacks.
If microphones are connected to front panel MIC jacks, a source connected to DIN connector cannot be recorded.

OUTPUT (PLAYBACK LEVEL) CONTROLS

Use these to adjust the output signal level during playback. Turning the controls to the right increases the level. The controls are coupled when turned but it is also possible to adjust the right channel (rear) and the left channel (front) independently.

BIAS CONTROL

Use this control to adjust the bias in accordance with the characteristics of the tape being used. It is set so that the center (click stop) position corresponds to the standard bias. For further details, refer to "ADJUSTING THE BIAS" on page 9.

TAPE SWITCH

Use this switch to select bias and equalization characteristics when recording, and equalization characteristics when playing back in accordance with the type of tape being used.

STD: For standard tapes and low-noise/high-output (LH) tapes.

Fe-Cr: For ferrichrome tapes.

NOTE:
There is no need to operate this switch if you are using a chrome tape since the bias and equalizer are selected automatically by the built-in mechanisms. Make sure that your chrome tape has the extra detection holes shown in the figure on page 11. The chrome tape detector will not work with chrome tapes which are not equipped with these detection holes, and so this type of tape should not be used.

MIC JACKS

These are the input jacks for microphone recording. Plug the left channel microphone into the L jack and the right channel microphone into the R jack.

INPUT (RECORDING LEVEL) CONTROLS

Use these to adjust the level of the input signals from the MIC jacks or rear panel INPUT and DIN jacks.

Turning these controls to the right increases the level. How to setting the recording level is detailed on page 9.

The controls are coupled to the left and right channels, but you can also use them to adjust the right channel (rear) and the left channel (front) independently.

HEADPHONE JACK

This is the output jack for your stereo headphones. You will be able to hear sound from signals selected by the MONITOR switches. Use this jack when you want to monitor the quality of a recording or when you want to listen to a tape privately on the CT-F900. Adjust the output level with the OUTPUT controls.

NOTES:
- *Use low-impedance headphones. If you use a high-impedance model, you will not be able to obtain sufficient volume.*
- *You will damage the microphone if you plug it into the HEADPHONES jack by mistake.*

LEVEL METER

This indicates the input level during recording and the output level during playback.
By operating the METER selector switches, it can be made to function as a peak meter, a peak hold meter or as a level meter.
The input signal level is indicated when the MONITOR SOURCE switch has been depressed, and the playback output level is indicated when the MONITOR TAPF switch has been depressed.

TAPE INDICATORS

CrO_2 : This light comes on when a chrome tape is being used. It will come on when a cassette is not loaded but this does not indicate a failure.

Fe-Cr : This light comes on when a cassette is loaded and the TAPE switch is set to Fe-Cr.

DOLBY NR INDICATOR

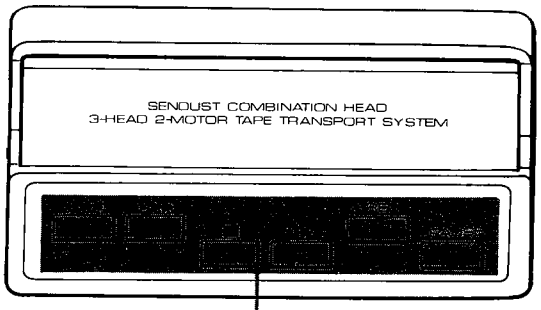
This lights up when the DOLBY NR switch is set to ON.

TAPE COUNTER

This indicates the position of the tape run. The counter reverts to "000" when the power is switched on.

COUNTER RESET SWITCH

Depress this switch to reset the tape counter display to "000."



OPERATING SWITCHES

◀◀ (REW): Depress this switch to rewind the tape. (The tape will travel at high speed from right to left.)

▶▶ (FF): Depress this switch to send the tape forward at top speed. (The tape will travel from left to right.)

■ (STOP): Depress this switch to stop the tape run and to release the operating switches.

▶ (PLAY): Depress this switch when playing back a tape. (The tape will travel from left to right.)

REC: Depress this switch together with the PLAY switch for recording.
This switch will not work when a cassette is not loaded or when the erasure prevention tabs of a loaded cassette have been broken off.

PAUSE: Depress this switch to stop the tape temporarily during recording or playback. Depress it again to allow the tape tc continue to travel as before.

NOTES:
- *When any of the operating switches are depressed, the corresponding indicator (except STOP mode) will come on signifying that the deck is set to that respective mode.*
- *All the operating switches are released (OFF) to stop mode when the POWER switch is turned OFF.*

MEMORY/REPEAT SWITCHES

STOP: Depress this switch and the tape will be rewound to that spot at which the tape counter was preset to "000" during rec/play, when the REW switch is depressed at any position you like.

PLAY: Depress this switch and the tape will be rewound to that spot at which the tape counter was preset to "000" during rec/play, and playback will start from that spot, when the REW switch is depressed at any position you like.

COUNTER: Depress this switch when you want to play back a tape during playback or recording from the point at which the tape counter was set to "000" up to the end of the tape.

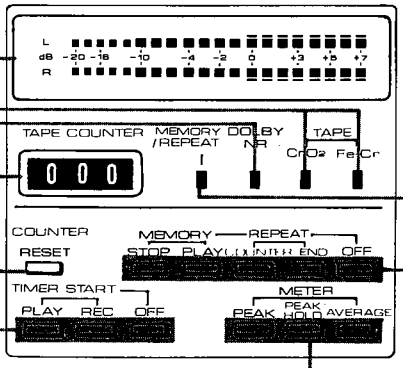
END: Depress this switch when you want to play back a tape from the beginning to the end of that tape.

OFF: Depress this switch during normal tape playback or recording to release the MEMORY and REPEAT switches.

For further details, refer to "REPEAT PLAYBACK FUNCTION."

MEMORY/REPEAT INDICATOR

This indicator comes on when the MEMORY/REPEAT switches are depressed, signifying that the deck is set to the respective mode.



METER SWITCHES

PEAK: The meter functions as a peak level meter when this switch is depressed.

PEAK HOLD: The meter functions as a peak level meter and the highest level of the signals is indicated when this switch is depressed.

AVERAGE: The meter functions as a level meter when this switch is depressed.

For further details, refer to "SETTING THE RECORDING LEVEL" on page 9.

TIMER START SWITCHES

Depress these switches when you are playing back or recording a tape with the use of a timer.

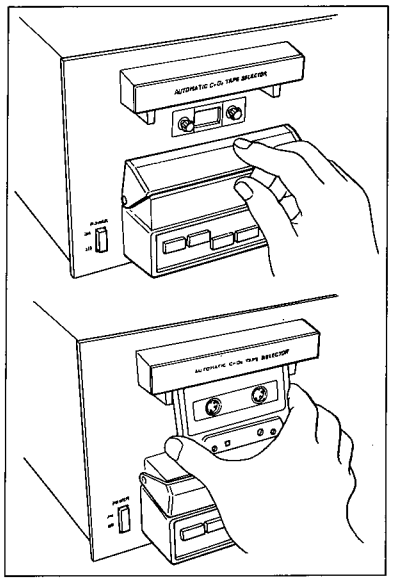
REC: When this switch is depressed, the deck will automatically be set to the recording mode at the preset timer time, and recording will begin. Use this switch for recording FM programs when you are out of the house or otherwise occupied.

PLAY: When this switch is depressed, the deck will automatically be set to the playback mode at the preset timer time, and playback will begin. Use this switch for wake-up playback instead of an alarm clock.

OFF: Always depress this switch when you do not intend to record or playback a tape using the timer. (This will release the REC and PLAY switches of TIMER START.)

BASIC OPERATIONS

TAPE INSERTION

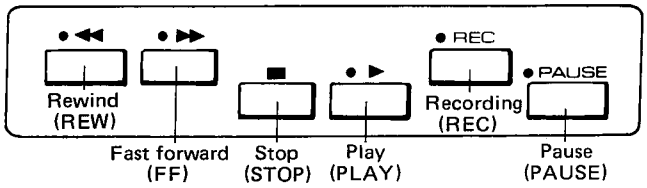


Place your forefinger on the edge of the dust cover and pull towards you.

Aligning the cassette tape with the guide, push upward and insert. When you want to remove the tape, pull it towards you.

Be sure not to take out cassette tape during tape running.

TAPE RUN



Play and record

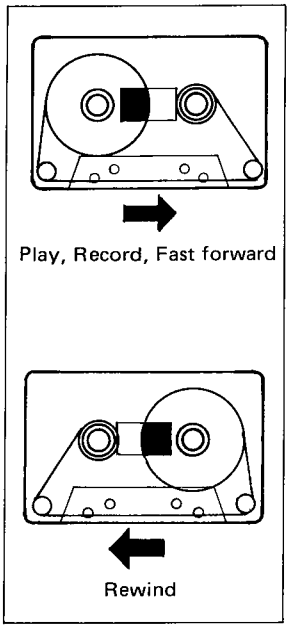
1. Check that the tape is on the left reel.
2. The tape runs from left to right when the PLAY switch is depressed. If the REC switch is also depressed together with the PLAY switch, the deck will be set to the recording mode.

Fast forward

1. Check that the tape is on the left reel.
2. The tape runs from left to right at high speed when the FF switch is depressed for a fast-forward operation.

Rewind

1. Check that the tape is on the right reel.
2. The tape runs from right to left at high speed when the REW switch is depressed, and the tape is rewound.



NOTES:

- *You do not have to depress the STOP switch when selecting the next mode with the CT-F900.*
- *Do not depress more than one switch at a time except when recording and for PAUSE mode.*

STOP OPERATION

Stop

Depress the STOP switch to stop the tape motion. The operating switch indicators will go off.

Using the Pause Switch

1. The tape will stop when the PAUSE switch is depressed while the tape is traveling (recording or playback), and the PAUSE indicator will come on.
2. When the PAUSE switch is depressed again, the tape will start traveling again (recording or playback).

NOTES:

1. *When stopping the tape for a prolonged period of time, use the STOP switch.*
2. *When using a pre-recorded tape to re-record a program, bear in mind that the pre-recorded sound will sometimes not be erased at the place on the tape where you set the deck to the PAUSE mode.*

The PAUSE switch comes in handy in the following instances:

- When the recording level is set.
- When you want to edit out some portions of a program during recording and then continue recording.

AUTO-STOP

The tape is automatically stopped by the auto-stop mechanism when the tape is completely wound onto one reel during each operating mode (recording, playback, fast forward, rewind) without the STOP switch having to be depressed. When this mechanism is actuated, the operating switch indicators will go off.

NOTE:
The auto-stop mechanism is actuated several seconds after the tape is fully rewound onto one reel.

Tape slack take-up mechanism

The CT-F900 employs two capstans and so any slack in the tape will impair the effectiveness of their performance.
To safeguard against this kind of malfunction, the deck is provided with a tape slack take-up mechanism which eliminates any slack. What happens is that when the cassette tape is loaded, it sets the deck to the rewind mode for a mere second and takes up the slack.
If, however, there is a great deal of slack, use a pencil or similar object to take it up before you load the cassette tape.
Take care when taking up the slack with a cassette whose tape is nearly fully wound since there will be a slight increase in the tape movement and the program start portion may be shifted. In cases like this, reset the tape counter to "000" before loading the cassette, and record the program start location.

REPEAT PLAYBACK FUNCTION

REPEAT SWITCHES

These switches enable you to listen repeatedly to tape playback.

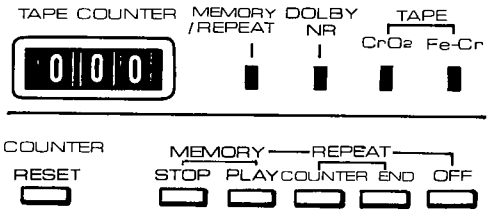
REPEAT COUNTER SWITCH

1. Depress the REPEAT COUNTER switch to set it to ON.
2. Depress the COUNTER RESET switch at the start of the program during playback or when recording which you want to hear repeatedly, and set the tape counter to "000."
3. When the tape is fully wound on to the right reel, it will automatically be rewound about two seconds later.
4. The tape will be rewound as far as the "999" indication on the tape counter.
5. The tape will now automatically start to play back.

REPEAT END SWITCH

1. Depress the REPEAT END switch to set it to ON.
2. The tape now plays back (or records).
3. The tape will be rewound automatically about two seconds after it has been wound onto the right reel.
4. The tape will be rewound to the starting point.
5. The tape will now start to play back automatically.

- The tape will continue to be played back repeatedly until the MEMORY REPEAT OFF switch is depressed.



MEMORY SWITCHES

There are two MEMORY switches (MEMORY PLAY and MEMORY STOP). The MEMORY STOP switch serves to rewind a tape during playback or recording as far as the preset "999" indication on the tape counter and to stop the tape run. The MEMORY PLAY switch serves to start the tape playback from the "999" indication on the tape counter automatically.

MEMORY STOP SWITCH

1. Depress the MEMORY STOP switch to set it to ON.
2. Depress the COUNTER RESET switch at that place on the tape during playback or recording which you want to re-record or re-play again, and set the tape counter to "000."
3. Depress the REW switch once the playback or recording is completed.
4. The tape will be rewound and it will stop at the tape indication of "999."

MEMORY PLAY SWITCH

1. Depress the MEMORY PLAY switch to set it to ON.
2. Depress the COUNTER RESET switch at that place on the tape during playback or recording which you want to be played back again later, and set the tape counter to "000."
3. Depress the REW switch once the playback or recording is completed.
4. The tape will be rewound and it will stop at the tape counter indication of "999."
5. The tape will automatically start playing back.

NOTE:
Always depress the MEMORY REPEAT OFF switch to release the MEMORY PLAY and MEMORY STOP functions.

OPERATING NOTES

- If you set the MEMORY PLAY and the REPEAT COUNTER switches to ON and then set the deck to the rewind mode with the tape counter display indicating "999" or less, the deck will be automatically set to the repeat end mode (whereby the tape is played back automatically after it has been wound up) immediately after the tape has been wound up. This does not indicate a failure.

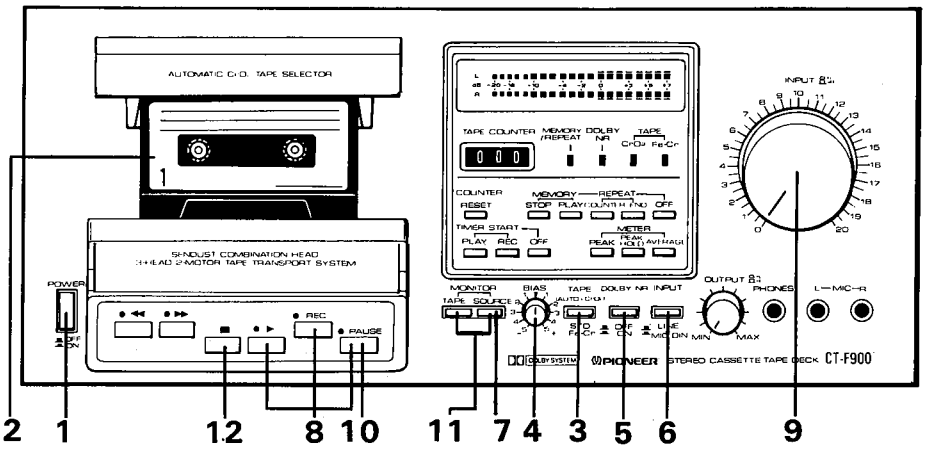
  When you set the deck to the stop mode upon completion of the rewind operation under these circumstances, set the MEMORY/REPEAT switch to OFF.
- During the repeat counter operation (whereby the tape is automatically set to the repeat playback mode) the portion of the tape with the start of the program will shift slightly forward. This is due to the inertia of the tape itself and is not a failure.

RECORDING

Follow the recording procedure below in numerical order. The step numbers are illustrated in the figure.

Set the switches and controls as follows before you switch the power on.

- Depress the MEMORY REPEAT OFF switch.
- Depress the TIMER START OFF switch.
- Depress the METER-AVERAGE switch.
- Depress the MONITOR TAPE switch.
- Set the INPUT controls to the leftmost position.
- Inspect the head section for dirt. If dirty, clean. (Refer to page 12.)
- Set up the program source (records, FM broadcast, microphone performance, etc.) which you intend to record.



1. Set the POWER switch to ON.

2. Insert the cassette tape.

Check that the tape is on the left reel. Also check that the cassette tape's erasure prevention tabs (refer to page 14) have not been broken off and then insert (refer to page 6).

3. Select the TAPE switch setting.

Set this switch to the Fe-Cr position if you intend to use a ferrichrome tape, and to the STD position if you are going to use a standard tape. The chrome tape detector is actuated with chrome tapes and so there is no need to touch this switch. (See page 11.)

4. Set the BIAS control.

Set the BIAS control to the center (click stop) position or to the setting that corresponds to the tape which you are using. For further details, refer to "ADJUSTING THE BIAS" on page 9.

5. Set the DOLBY NR switch.

Set this switch to ON for Dolby recording. (Refer to page 13.)

6. Set the INPUT selector switch

Set this switch to LINE when recording signals from the INPUT jacks on the rear panel, and to MIC/DIN when recording signals from the microphone or DIN connector.

7. Depress the MONITOR SOURCE switch.

8. Stand by for recording.

Depress the PAUSE switch first, and then the PLAY and REC switches together. Depress the PAUSE switch, allow the tape to run for about 5 seconds and then depress the PAUSE switch again if you want the leader tape to run free of the heads or if you want to record a blank (no signals) between programs.

9. Set the recording level.

Refer to "Setting the recording level" on page 9 and then set the INPUT controls.

10. Start recording.

First depress the COUNTER RESET switch and set the tape counter to "000."
Then release the PAUSE switch, start the performance of the program source, and start recording.

11. Monitoring the recording

You can monitor the recording level on the level meter or, depress the MONITOR TAPE switch and you will then be able to listen and compare the sound quality with that when the MONITOR SOURCE switch was depressed. If there is anything wrong with the sound when the MONITOR TAPE switch is depressed, it may be due to a deformed tape, dirt in the head section or the recording level or BIAS control and TAPE switch may be set incorrectly. Locate the fault and start recording again.

12. Complete recording.

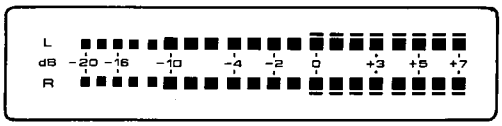
When the recording is completed, depress the STOP switch and stop the tape. Depress the PAUSE switch to stop the tape temporarily. The auto-stop mechanism will be automatically actuated when the tape is fully wound onto the right reel during recording.

SETTING THE RECORDING LEVEL

If you record a program source at a recording level which is unsuitable, the signal-to-noise ratio of the playback sound will deteriorate and the distortion will increase. Set the level according to the following procedure and safeguard against poor recordings.

1. Depress the METER-AVERAGE switch.
   When the signals of the program source you intend to record are comparatively strong, adjust the INPUT knobs so that the meter indication is within a —3dB to 0dB range.
2. Now depress the METER-PEAK or PEAK HOLD switch.
   Adjust the INPUT knobs so that the meter indication does not continuously go beyond 5dB.
3. Depress the METER-AVERAGE switch and check that the meter indication is less than 0dB.

- If you record a sound source when the meter indication exceeds full scale, the playback sound will be distorted. Conversely, if the meter indication is too low (—20dB to —10dB), the signal-to-noise ratio will deteriorate and you will hear a great deal of noise when you play your recording back.
- If you adjust the recording level merely on the basis of the peak signal indication, the recording level will be set too low since you have adjusted it with the maximum input signal value. As a result, the signal-to-noise ratio will be downgraded.
- The signal level will fluctuate widely according to the program source, and so keep observing the meter indication while you are recording.



- The +3 mark indicates Dolby NR level.

Fig. 3

NOTE:
In rare case, the level meter and tape counter may not be normally operated, when switching the POWER "ON-OFF" continuously.
In this case, switch the POWER "OFF" and set the POWER "ON" again a few seconds later.
Then it will be normally operated.

PEAK METER AND LEVEL METER

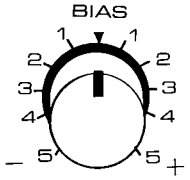
The peak meter can cope more sensitively with sudden peak inputs than the level meter can. The level meter serves almost to simulate your sense of hearing, and it indicates the average strength of the input signals. Naturally, the peak input signal which is recorded has a higher level than the average level and so the standard '0dB' level meter level is set lower than the saturation level of the tape.

The peak meter is constructed so that its very fast response speed indicates peaks even if pulse-like signals are included in the input signals. When performing live recordings or when recording sources with a great many peak portions, make use of the peak meter and you will then ensure that the sound will not be distorted at the peak level. The peak hold meter not only functions as a peak meter but it also holds the peak level to display it.

ADJUSTING THE BIAS

Your recordings will display the maximum sound quality with the minimum distortion if you select a bias which agrees with the characteristics of the tape you are using.
The center (click stop) position of the CT-F900's BIAS control is for the standard bias but you can also adjust the bias optimally in accordance with the tape being used.

1. Follow steps 1 to 9 in the recording procedure and set the cassette deck to the recording standby mode.
2. Depress the MONITOR TAPE switch.
3. Depress the PAUSE switch, then allow the tape to run and record the program source.
4. Monitor the playback sound through the speakers or headphones and at the same time set the BIAS control to the optimum position in accordance with the characteristics of the tape.
5. Depress the MONITOR SOURCE switch and rewind the tape as far as the point on the tape from which you want to start the recording.



The optimum BIAS control position of leading brands of tape is listed in the table 1.

Fig. 4

NOTE:
Adjust the bias after you have mastered the recording procedure.

SETTING THE TAPE SWITCH

At the same time as you select the bias in accordance with the tape you are using, it is necessary to compensate for the high-end of the frequency range. Set the TAPE switch in accordance with the type of tape you are using (see Table 1). If you are using a chrome tape, the selection is performed automatically by the built-in chrome tape detector. This mechanism will not work with chrome tapes which are not provided with chrome tape detection holes, so do not use this type of tape (see page 11).

Table 1. Leading brands of tape, and standard TAPE switch positions

Brand of tape		Bias control position	EQ switch position
BASF	LH C-60	– 2 (–2.5~–1.5)	STD
	LH C-90	–1.5 (–2 ~ –1)	
	LN C-60	– 5 (–5 ~ –4.5)	
	LN C-90	–1.5 (–2 ~ –1)	
	LH SUPER C-60	– 2 (–2.5~–1.5)	
	LH SUPER C-90	–1.5 (–2 ~ –1)	
	SLH-I C-60	+1.0 (+0.5~+1.5)	
AGFA	LH C-60	– 2 (–2.5~–1.5)	
	LH C-90	–1.5 (–2 ~ –1)	
	SUPER COLOR C-60, C-90	–1.5 (–2 ~ –1)	
	SUPER DYNAMIC C-60 +6	–1.5 (–2 ~ –1)	
	SUPER DYNAMIC C-90 +6	–0.5 (–1 ~ 0)	
SCOTCH	LH C-60, C-90	–2.5 (–3 ~ –2)	
	CRYSTAL C-60, C-90	0 (–0.5~+0.5)	
	MASTER C-60, C-90	+0.5 (0 ~ +1)	
TDK	D C-60, C-90	– 2 (–2.5~–1.5)	
	SD C-60, C-90	–1.5 (–2 ~ –1)	
	ED C-60, C-90	–1.5 (–2 ~ –1)	
	AD C-60, C-90	+1 (+0.5 ~ +1.5)	
MAXELL	LN C-60	–1.5 (–2 ~ –1)	
	LN C-90	– 1 (–1.5 ~ 0)	
	UD C-60, C-90	+1 (+0.5~+1.5)	
	UD XLI C-60, C-90	0 (–1.5~+0.5)	
FUJI	FL C-60, C-90	– 2 (–2.5~–1.5)	
	FX C-60	0 (–0.5~+0.5)	
	FX C-80, C-90	0 (–0.5~+0.5)	
	FX Jr C-60, C-90	+0.5 (0~+1)	
	FX DUO C-60, C-90	0 (–1.5~+0.5)	
	FX-I C-60, C-90	0 (–0.5~+0.5)	
SONY	LN C-60	– 2 (–2.5~–1.5)	
	LN C-90	–1.5 (–2 ~ –1)	
	HF C-60, C-90	0 (–0.5~+0.5)	
SONY	DUAD C-60	0 (–3 ~ +3)	Fe-Cr
	DUAD C-90	– 3 (–5 ~ 0)	
BASF	FERROCHROM C-60	– 1 (–4~+2)	
	FERROCHROM C-90	– 3 (–4.5~–1.5)	
SCOTCH	CLASSIC C-60, C-90	–4.5 (–5~–1.5)	
BASF	CHROME C-60	+0.5 (0~+1)	CrO_2 (Chrome) Automatically selected
	CHROME C-90	0 (–0.5~+0.5)	
SCOTCH	MASTER 70μs EQ C-60	0 (–0.5~+0.5)	
TDK	SA C-60, C-90	0 (–0.5~+0.5)	
	NEW SA C-60, C-90	0 (–0.5~+0.5)	
	KR C-60, C-90	0 (–0.5~+0.5)	
MAXELL	C-60 CR,C-90 CR	0 (–0.5~+0.5)	
	UD XLII C-60, C-90	–0.5 (–1 ~ 0)	
FUJI	FC C-60	–0.5 (–1 ~ 0)	
	FC C-90	0 (–0.5~+0.5)	
SONY	CR C-60, C-90	+1.5 (+1~+2)	

NOTE:
Set the position of the bias control to match the reference position given in the above table for every tape that you use. Sometimes you will get better results by choosing a different position — it depends on the tape. In cases like this, set to the optimum position within the range shown in parentheses in the above table.

FOLLOW-ON RECORDING

You can record a new program source onto a prerecorded tape which is playing in the deck if you depress the PLAY and REC switches together. This procedure is particularly effective for tape editing.

USING THE MONITOR SWITCHES

The CT-F900 adopts an independently aligned erase/recording/playback 3-head system. If you depress the MONITOR TAPE switch during recording, you can listen to the program which you have just recorded. If you depress the MONITOR SOURCE switch, you can listen in to the program which you have just recorded. This means that by selecting the switches you can monitor the recording through your headphones. Set the stereo receiver's TAPE MONITOR switch to ON when monitoring a recording from a stereo receiver connected to the CT-F900.

ERASING RECORDED SOUND

- To completely erase a program which you have already recorded turn the recording level (INPUT) controls to their leftmost position, and run the tape with the deck set to the recording mode.
- When recording a new program over a prerecorded tape, the previous sound will be automatically erased and the new program will be recorded over it.

MICROPHONE RECORDING

STEREO RECORDING

As shown in Fig. 5 use a stereo microphone or two identical microphones and connect the one for the left channel to the MIC L jack and the one for the right channel to the R MIC jack. For the actual recording, refer to page 8 and "Recording."

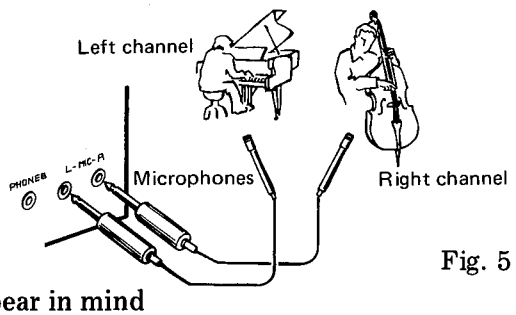


Fig. 5

Points to bear in mind

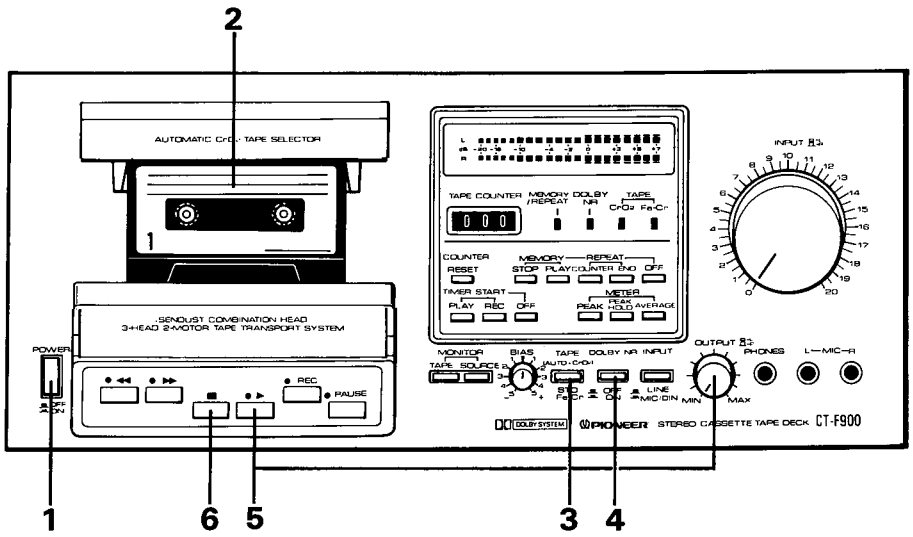
- Use dynamic or electret microphones.
- Make sure that the connecting cord for a high-impedance microphone is less than 5 meters long.
- You will not have to worry about howl if you use your headphones to check the state of the recording.
- Monitoring the recording with the speakers very often gives rise to howl so use the microphones as far away as possible from the speakers. There will be no howl, however, with headphones.
- You may damage the microphone if you plug it into the HEADPHONE jack by mistake.

PLAYBACK

Follow the playback procedure below in numerical order. The step numbers are illustrated in the figure.

Set the switches and controls as follows before you switch the power on.

- Depress the MEMORY REPEAT OFF switch.
- Depress the TIMER START OFF switch.
- Depress the METER-AVERAGE switch.
- Depress the MONITOR TAPE switch.
- Set the OUTPUT controls to the center position.
- Check that the head section is not dirty. If dirty, clean it.
- Set the stereo receiver's power switch and the TAPE MONITOR switch to ON to enable tape playback.



1. Set the POWER switch to ON.

2. Insert a cassette tape.

Check that the tape is on the left reel and then insert (Refer to page 6).

3. Select the TAPE switch setting.

Set this switch to the Fe-Cr position if you intend to use a ferrichrome tape, and to the STD position if you are going to use a standard tape. The chrome tape detector is actuated with chrome tapes and so there is no need to touch this switch (See below).

4. Set the DOLBY NR switch.

Set this switch to ON when playing back a Dolby recorded tape. For further details on the Dolby system, refer to page 13.

5. Start playback.

Depress the PLAY switch and the tape will start to run. Adjust the volume to the preferred level by rotating the OUTPUT control on the CT-F900, and the volume control on the stereo receiver.

6. Complete playback.

The tape will stop when it has been wound onto the right reel, and the PLAY indicator will go off.

Depress the STOP switch when you want to stop the tape run during playback. Depress the PAUSE switch for a temporary stop.

NOTE:
The CT-F900 can be set up for automatic repeat tape playback. Refer to "REPEAT PLAYBACK FUNCTION" on page 7 for details.

CHROME TAPE DETECTOR

The CT-F900 comes with a chrome tape detector mechanism. If the cassette tape is provided with detection holes, the deck's bias and equalization circuitry is actuated automatically and set to cater to the chrome tape.

Therefore, when using a chrome tape, make sure that it is provided with the extra holes (see Fig. 6).

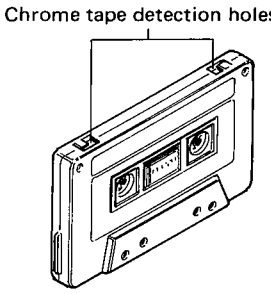


Fig. 6

OPERATIONS WITH THE TIMER

UNATTENDED RECORDING

If you use an optional timer, you will be able to automatically record an FM broadcast or other program source at a specified time. This is convenient for recording programs when you are out or asleep.

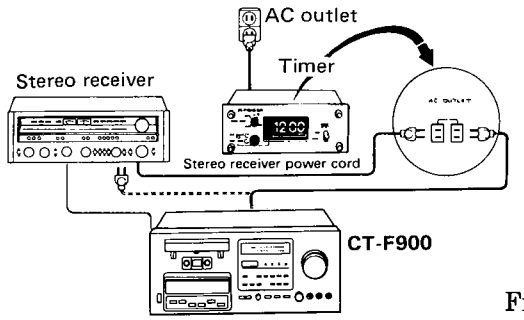


Fig. 7

1. As shown in Fig. 7 connect the CT-F900's power cord to the timer. At the same time connect the power cord of the stereo component (receiver, tuner, or amplifier, etc.) which is connected to the CT-F900 so that the power ON/OFF functions of that component are controlled by the timer.
2. Set the power switches of the CT-F900 and stereo component to ON, and select the broadcasting station whose program you want to record.
3. Follow steps 1 to 9 in the section on "RECORDING" on page 8 and set the recording level. Rewind the tape back to the point at which you want to start recording.
4. Set the timer so that the power will come on at the prescribed time. The power to the other stereo components goes off.
5. Depress the TIMER START REC switch.
6. At the prescribed time the power will automatically go on, and the REC and PLAY switch indicators will light up about three seconds later. Recording will then commence. When the tape is completely wound onto the reel, the auto-stop mechanism is actuated and the tape is stopped. Next, the timer operates and switches the power to the CT-F900 and the stereo component off.

- *Turn the receiver's volume control right down so that the sound is not heard through the speakers while you are out.*
- *For more details on the connections, refer to the timer's instructions booklet.*
- *Set the time on the timer so that the power to the CT-F900 and stereo component goes off after the tape is fully wound onto the right reel.*

WAKE-UP PLAYBACK

You can have the CT-F900 play back a prerecorded tape automatically at a desired time. You can set the timer so that the tape's music wakes you up instead of an alarm clock.

1. As shown in Fig. 7, connect the CT-F900.
2. Follows steps 1 to 5 in "PLAYBACK" on page 11, and set up the CT-F900. Rewind the tape back to the point at which you want to start playback.
3. Set the timer so that the power is switched on at the desired time.
4. Depress the TIMER START PLAY switch.
5. At the prescribed time the power will come on, the PLAY switch indicator will light up about 3 seconds later, and the tape will start to play back.

MAINTENANCE

Follow the maintenance instructions below to keep your deck working in tip-top condition.

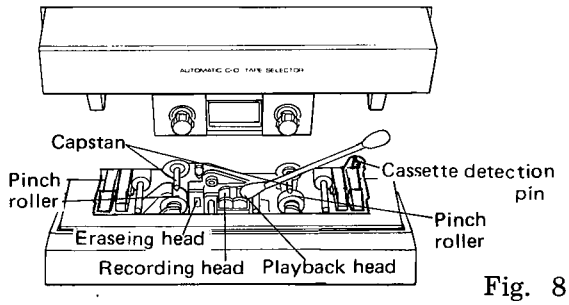


Fig. 8

CLEANING THE HEAD SECTION

Fig. 8 shows that the head section is composed of the heads, capstan and pinch rollers, and with extended use these parts accumulate dust, dirt and grease easily as the tape runs.

If this assembly gets dirty, the contact between the tape and the surface of the heads is impaired and this downgrades the sound quality and stereo balance, and it also leads to unstable operation. To prevent this, clean the head section and the surrounding parts regularly with the accessory cleaning swabs or with a soft cloth dipped in the accessory cleaning fluid.

You will find that it is easier to clean the pinch roller if you depress the cassette detection pin and the PLAY switch, since this operation will cause the pinch roller to rotate.

NOTE:
When the cassette detection pin is depressed, the tape slack take-up mechanism will be actuated. This does not indicate a failure so continue to clean the pinch roller.

DEMAGNETIZING THE HEADS

The recording head becomes magnetized when you use the tape deck for prolonged periods of time. This results in noise being generated and the treble dropping off during recording and playback. The recording head should therefore be regularly demagnetized with the head eraser, which is sold separately. For further details, refer to the head eraser's instructions booklet.

CLEANING THE FRONT PANEL, DUST COVER

Use a soft cloth to wipe off dust and grease from the front panel and dust cover. When these parts are very dirty, dip the soft cloth in a small amount of neutral cleanser, remove the dirt and wipe dry with a dry cloth. Never use volatile spirits like thinners, benzine or alcohol because they will damage the panel's finish.

THE DOLBY SYSTEM

A cassette tape travels at one quarter of the speed of an open-reel (19cm/sec, 4-track) tape, and its track width is only 60 per cent in comparison. The cassette tape is thus clearly at a disadvantage with respect to the signal-to-noise ratio.

The Dolby system is designed to reduce the noise called hiss which is inherent in tapes, and it is effective in upgrading the signal-to-noise ratio. It is so effective, in fact, that it is now indispensable to cassette decks.

The basic principle behind the Dolby system is as follows: when signals with a relatively low level are recorded, the Dolby circuitry enhances the signals in the high-frequency range which has most of the hiss components, and these signals are then recorded. When they are played back, the circuitry attenuates only those components which were enhanced during recording. This returns the signal components to the normal level, and the hiss is reduced (by a maximum of 10dB) during playback only for that level which was attenuated. In the same way, if the Dolby system is used for recording, the recording level can be set relatively low which enables almost distortion-free good sound quality tape recordings.

Operating precautions

- The adjustment of the recording level is basically the same as when the Dolby system is not used.
- In order to make the most of the Dolby effect, choose a program source with as little noise as possible.
- If you have used the Dolby system to record a program, make sure that you use it when playing the same program back.
- Playing back a normally recorded tape with the Dolby system and playing back normally a Dolby-recorded tape will result in an unnatural reproduction of the sound on the tape.

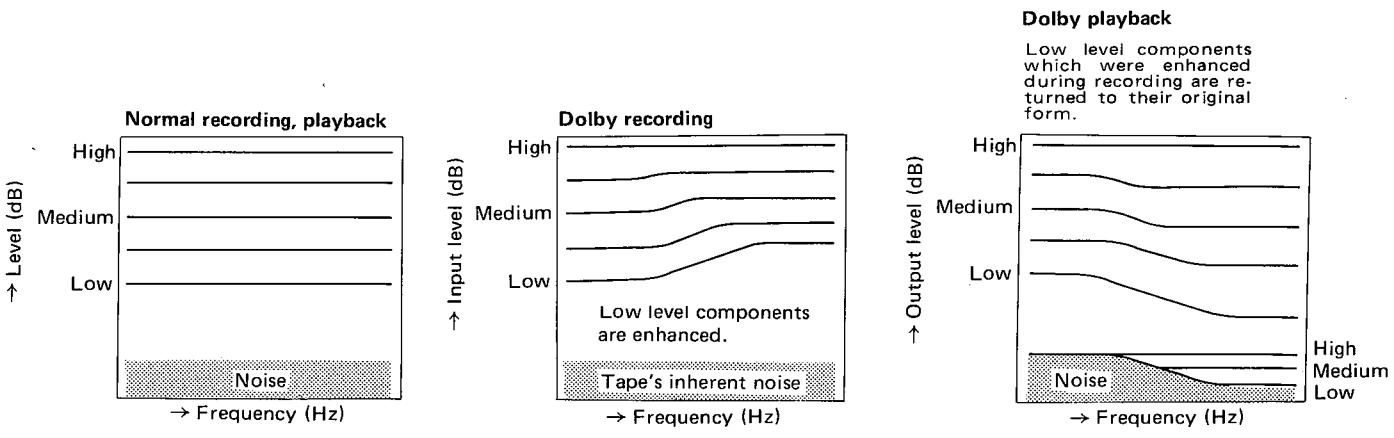


Fig. 9

CASSETTE TAPES

Cassette tapes are manufactured according to international standards governing their construction, and they are generally classified according to their tape performance and recording time.

Performance classifications

Standard type	Low-noise type	High-performance type
• Standard tape • Dynamic tape	• Low-noise tape • Low-noise, high-output tape	• Chrome tape • Ferrichrome tape

NOTE:
You can set the TAPE switch on the CT-F900 to the suitable positions for all these tapes. For further details, refer to page 9 and the section on "SETTING THE TAPE SWITCH."

Recording time classifications

Cassette tape designation	Recording time (minutes)	
	One side	Both sides
C-30	15	30
C-46	23	46
C-60	30	60
C-90	45	90
C-120	60	120

The size of the cassette tapes is the same but their playing (and recording) times differ according to the tape thickness (length).
The C-60 and C-90 tapes are most commonly used. The C-120 tapes are not recommended because their mechanical and electrical specifications vary.

CHECK CASSETTE BEFORE USE

Slack or protruding tapes

If the tape protrudes from the cassette as shown in Fig. 10 or is slack, the tape may run without passing through between the capstan and the pinch roller and so may be damaged. Take up the slack by inserting a pencil through the reel hub and turning it as indicated in the figure.

Some tapes provide a tape stopper to prevent tape slack. Make sure that you remove the tape stopper before inserting the tape into the deck.

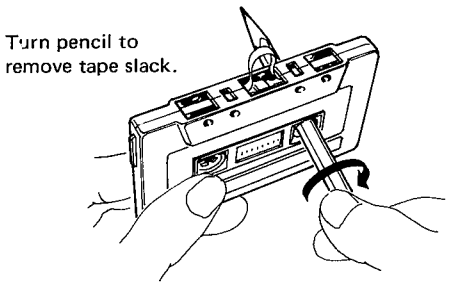


Fig. 10

Erasure prevention tabs

Cassette tapes are provided with erasure prevention tabs, as shown in Fig. 11, which act as a protection device to prevent the accidental erasure of a recording which you want to keep. If you remove the tabs, as shown in Fig. 11, with a screwdriver you will be able to prevent erasure if you accidentally set the CT-F900 to the recording mode by depressing the REC switch.
To re-record, cover the tab opening with a double layer of adhesive tape (Fig. 12).

NOTE:
Cassette tapes are provided with two tabs (A or 1 and B or 2) so you can protect the recordings on both sides.

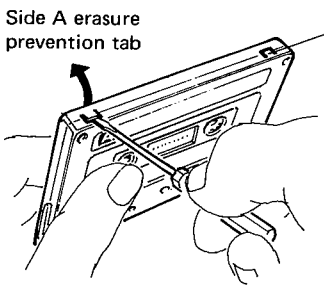


Fig. 11

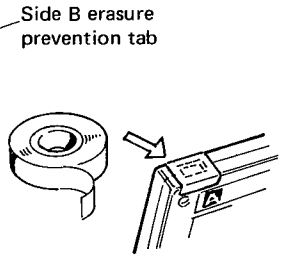
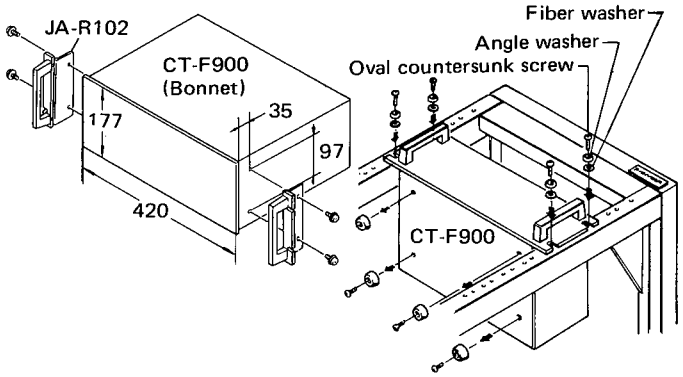


Fig. 12

MOUNTING IN AN EIA STANDARD RACK

If you mount the JA-R102 (made by Pioneer) which is available as an option onto the CT-F900, you will be able to mount your deck into an audio rack featuring a 4U pitch and conforming to EIA standards. The mounting procedure is simple: just remove the two screws at either side in front which hold the deck's bonnet in place, and then mount the JA-R102 onto the deck with the JA-R102's accessory screws. For further details, refer to the JA-R102's instructions booklet.



SPECIFICATIONS

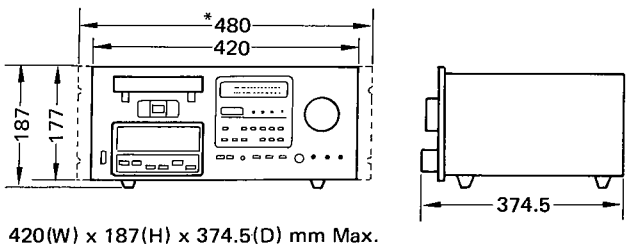
Systems . . . . . Compact cassette, 2-channel stereo
Motors . . . . . Capstan drive; DC servo motor x 1
Reel drive; DC high torque motor x 1
Heads. . . . . Sendust recording/
playback combination type head x 1
Ferrite erasing head x 1
Fast Winding Time . . . . . Approximately 85 seconds
(C-60 tape)
Wow and Flutter . . . . . No more than 0.04% (WRMS)
No more than ± 0.14% (DIN)
Frequency Response . . . . . Standard, LH tapes; 20 to 17,000Hz
(30 to 15,000Hz ± 3dB),
(35 to 14,000Hz DIN)
Chromium dioxide tape; 20 to
19,000Hz (30 to 17,000Hz ± 3dB),
(30 to 15,000Hz DIN)
Ferrichrome tape; 20 to 19,000Hz
(30 to 17,000Hz ± 3dB)
Signal-to-Noise Ratio . . . . . Dolby NR OFF; More than 54dB
Dolby NR ON; More than 64dB
(over 5kHz, standard, LH tapes)
When chromium dioxide tape is used, signal-to-noise ratio is further improved by 4.5dB over 5kHz
More than 58dB (DIN)
Harmonic Distortion . . . . . No more than 1.3% (0dB)
Inputs (Sensitivity/Maximum allowable input/Impedance)
MIC (L, R); 0.3mV/100mV/30 kilohms, 6mm diam. jacks (Reference MIC impedance; 250 ohms to 30 kilohms)
LINE (2-channel stereo); 60mV/25V/100 kilohms, Pin jacks
REC/PLAY x 1; Input & Output, 12mV/4V/2 kilohms 5p jack (DIN standard)
Outputs (Reference level/Maximum level/Load impedance)
LINE (2-channel stereo); 450mV/640mV/50 kilohms, Pin jacks
REC/PLAY x 1; 450mV/640mV/50 kilohms 5p jack (DIN standard)
HEADPHONES x 1; 63mV/90mV/8 ohms, 6mm diam. jack
Semiconductors. . . . . Transistors x 63
Diodes x 71 (x 67 HG model)
ICs x 13, Photo interrupter x 1
Subfunctions
- Dolby system (ON-OFF) with LED indicator lamp
- Fluorescence tube level meter (−20 to +7dB) (Peak/Peakhold/average selector)
- Fluorescence tape counter
- Bias fine adjusting control knob
- Automatic tape selector for CrO_2 tape
- Memory stop/Memory play
- Counter repeat/End repeat
- Input selector (LINE/MIC-DIN)
- Automatic tape slack canceller
- Cassette compartment illumination
- Standby mechanism with unattended recording

Power Requirements . . . . . AC 120V, 220V, 240V (switchable) 50/60Hz (D, D/G model) or AC 220V, 240V (switchable) 50/60Hz (HG model)
Power Consumption . . . . . 44 watts

Dimensions . . . . . .
D, HG model only; 420(W) x 187(H) x 374.5(D)mm Max.
16-9/16 x 7-3/8 x 14-3/4 in.
D/G model only; 452(W) x 212.5(H) x 374.5(D)mm Max.
17-13/16 x 8-3/8 x 14-3/4 in.
Weight . . . . . HG model only; 10.1kg (22lb 4oz)
D model only; 10.6kg (23lb 6oz)
D/G model only; 13.6kg (29lb 16oz)
Furnished parts . . . . . Stereo connecting cords with pin plugs x 2
Head cleaning kit x 1
Fuse (D, D/G model only) x 1
(120V; 1.5A or 220V, 240V 1A)
Operating instructions x 1

NOTE:
Specifications and the design subject to possible modification without notice due to improvements.

NOTES:
1. Reference Tapes: Standard & LH: DIN 45513/BLATT6 or equiv.
: CrO_2: DIN 45513/BLATT7 (CrO_2) or equiv.
2. Reference Recording Level: Meter 0dB indicating level (160 nwb/m magnetic level = Philips cassette reference level)
3. Reference Signal: 333Hz
4. Wow & Flutter: • JIS [3kHz, with acoustic compensation (weighted), rms value] • DIN [3150Hz, with acoustic compensation (weighted) PEAK value]; • DIN 45507
5. Frequency Response: • Measured at −20dB level, DOLBY NR OFF, level deviation is ± 6dB without indication. • DIN is DIN 45500
6. Signal-to-Noise Ratio: • Measured at +4dB level (250nwb/m magnetic level = DIN 45513 specified reference level) • DIN is DIN 45500 (weighted)
7. Sensitivity: Input level (mV) required for reference recording level with input (REC) controls set to maximum.
8. Maximum Allowable Input: While decreasing settings of input (REC) level controls and increasing level at input jacks, this is the maximum input level (mV) at the point where recording amplifier output waveform becomes clipped.
9. Reference Output Level: Playback output level when meter indicates 0dB.
10. Maximum Output Level: Playback output level with respect to reference recording level when output (PLAY) level controls are set to maximum.



420(W) x 187(H) x 374.5(D) mm Max.

* with rackmount adaptor JA-R102
480(W) x 187(H) x 386.5(D) mm Max.

Unit: mm

LINE VOLTAGE AND REAR PANELS

CT-F900 are designed to accept different line voltages, according to the country in which they are to be used, although the operation of the various models is the same in every respect. Fig. 13 shows the model designed to operate at any of two pre-selected voltages (220V, 240V).
Fig. 14 shows the model designed to operate at any of three selected voltages (120V, 220V, 240V).
Line voltage and fuse can be changed and set as follows:

220V and 240V MODEL

1. Disconnect the A.C. mains cord.
2. Use a Phillips screwdriver to take out the Fuse cap and fuse (Fig. 15).
3. Pull out the VOLTAGE SELECTOR plug from the socket.
4. Rotate the plug until the cutaway aligns with the appropriate line voltage marker on the back of the unit, and then replace it in the socket.
5. Replace the fuse and FUSE CAP.

120V, 220V and 240V MODEL

1. Disconnect the A.C. mains cord.
2. Use a Phillips screwdriver to take out the FUSE CAP and fuse (Fig. 15).
3. Pull out the VOLTAGE SELECTOR plug from the socket.
4. Put the selector plug back so that the appropriate line voltage marking can be seen through the cut in the edge of the plug.
5. Change the fuse in accordance with the table.
6. Replace the fuse and FUSE CAP.

220V, 240V model Rear Panel

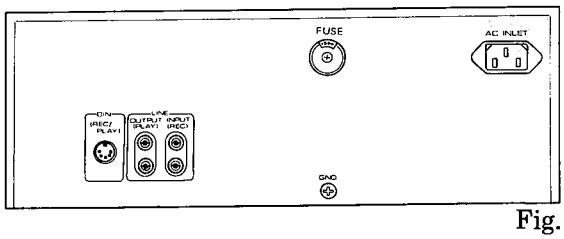


Fig. 13

FOR YOUR SAFETY

1. *Insert this plug only into effectively earthed three-pin plug-socket outlet.*
2. *If any doubt exists regarding the earthing, consult a qualified electrician.*
3. *Extension cords, if used, must be three-core correctly wired.*

120V, 220V, 240V model Rear Panel

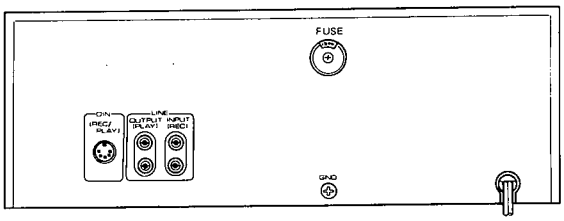


Fig. 14

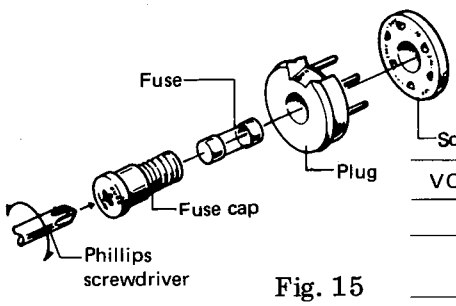


Fig. 15

Table

VOLTAGE	FUSE
120V	1.5A
220V 240V	1A

FOR USE IN UNITED KINGDOM OR AUSTRALIA

CAUTION 240V: **MAINS SUPPLY VOLTAGE IS FACTORY ADJUSTED AT 240 VOLTS.**

WARNING: **THIS APPARATUS MUST BE EARTHED.**

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Green-and-yellow:	Earth
Blue:	Neutral
Brown:	Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows.

The wire which is coloured green-and-yellow must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol ⏚ or coloured green or green-and-yellow.
The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black.
The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red.
The power cord should be connected last, make sure that the power switch is off. First insert the female appliance connector of the mains cord into the AC INLET, then plug the cord to the wall socket. Be sure that the appliance connector is fully inserted into the AC INLET. Unplug the set from the wall socket when it is not be used for an extended period of time.

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